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Report of the United Nations Expert on Space Applications

Contents

		Paragraphs	Page
I.	Introduction	1	2
II.	Mandate of the Programme	2-40	2
	A. Regional preparatory conferences for the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space	4-5	2
	B. Development of indigenous capability	6-14	3
	C. Long-term fellowship programmes for in-depth training	15-19	4
	D. Technical advisory services and promotion of regional cooperation	20-35	5
	E. Training courses, workshops, conferences and symposia organized by the United Nations	36-38	7
	F. Space information	39-40	8
III.	Voluntary contributions	41-42	8
IV.	Financial provisions and administration of activities during the biennium 1998-1999	43	9

Annexes

I.	Summary of the regional preparatory conferences for UNISPACE III held in 1998	10
II.	Long-range fellowships offered by the European Space Agency within the framework of the United Nations Programme on space applications, 1998-1999	13
III.	Summary of United Nations training courses, workshops, conferences and symposia held in 1998	14
IV.	United Nations Programme on Space Applications: schedule of training courses, workshops, conferences and symposia in 1999	18

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I. Introduction

1. At its thirty-fifth session, held at Vienna from 9 to 20 February 1998, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space reviewed the activities of the United Nations Programme on Space Applications. The Subcommittee noted that the 1997 activities of the Programme had been carried out satisfactorily, and that upon the recommendation of the Committee, the activities scheduled for 1998 had been endorsed by the General Assembly in its resolution 52/56 of 10 December 1997. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 1999 under the regular budget, and took note of other activities of the Programme, all of which were to be implemented as part of the space-applications-related recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82), as proposed by the Expert on Space Applications in his annual report (A/AC.105/693) submitted to the Scientific and Technical Subcommittee at its 1998 session. The present report reviews the steps taken to date to translate the mandate of the Programme into operational activities.

II. Mandate of the Programme

2. The General Assembly, in its resolution 37/90 of 10 December 1982, took into account the recommendations of UNISPACE 82 and expanded the mandate of the Programme to include, in particular, the following elements: (a) provision of assistance in the development of indigenous capability at the local level; (b) provision of long-term fellowships for in-depth training; (c) provision of technical advisory services to Member States and regional institutions upon request; (d) organization of regional and international training courses, seminars, workshops, conferences and technical expert meetings for the benefit of specialists, educators, managers and decision makers in order to enhance their technical capabilities and keep them abreast of ongoing developments in the discipline; (e) acquisition and dissemination of space-related information; and (f) promotion of greater cooperation between developed and developing countries, as well as among developing countries. Presented below are summaries of the activities carried out within the mandate of the Programme in 1998 and those scheduled for implementation in 1999. The activities to be organized in the year 2000 will be predicated on UNISPACE III recommendations.

3. In paragraph 23 of its resolution 52/56 of 10 December 1997, the General Assembly agreed that the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) should be convened at the United Nations Office at Vienna from 19 to 30 July 1999 as a special session of the Committee, open to all Member States of the United Nations. In its report on the work of its fortieth session, the Committee agreed that, as part of its programme of regular activities for 1998 and 1999, the Programme should organize regional preparatory conferences for UNISPACE III.[1] The organization of the special preparatory conferences was carried out in consultation with Member States in each region. The programme of each of the preparatory conferences also reflected the elements of the annotated agenda of UNISPACE III.

A. Regional preparatory conferences for the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space

4. From June 1997 through May 1998, the Office for Outer Space Affairs consulted with Member States on the hosting of the UNISPACE III regional preparatory conferences. On the basis of those consultations as well as those among Member States themselves, Malaysia, Chile and Morocco hosted the regional preparatory conferences for, respectively, Asia and the Pacific (Kuala Lumpur, 18-22 May 1998), Latin America and the Caribbean (Concepción, Chile, 12-16 October 1998) and Africa and the Middle East (Rabat, 26-30 October 1998). The preparatory conferences were issues-oriented and took into consideration the objectives of UNISPACE III, focusing on: (a) enhancing the understanding of Member States of the role and use of space technology in social and economic development; (b) issues associated with implementing space technology and applications programmes; and (c) improving and facilitating regional and international collaboration. Some key elements of the recommendations of the conferences are highlighted in annex I. The regional preparatory conference for UNISPACE III for eastern Europe will be held in Bucharest from 25 to 29 January 1999. The observations and recommendations of the regional preparatory conference for eastern Europe will be issued as an addendum to the present report.

5. Full reports on each of the regional preparatory conferences are contained in documents A/CONF.184/PC/2-5. A compilation of the recommendations of the conferences is contained in document A/CONF.184/PC/L.5 and Add.1.

B. Development of indigenous capability

6. The efforts of the Programme in developing indigenous capability at the local level has focused, in large part, on human resources development. In that connection, the General Assembly, in its resolution 45/72 of 11 December 1990, endorsed the recommendation of the Working Group of the Whole of the Scientific and Technical Subcommittee, as approved by the Committee, that:

> "... the United Nations should lead, with the active support of its specialized agencies and other international organizations, an international effort to establish regional centres for space science and technology education in existing national/regional educational institutions in the developing countries" (A/AC.105/456, annex II, para. 4 (n)).

7. The Programme continues to work with Member States at the regional level to establish the Centres. Details of those efforts are contained in paragraphs 8 to 14 below. The General Assembly, in its resolution 50/27 of 6 December 1995, also endorsed the recommendation of the Committee that "these centres be established on the basis of affiliation to the United Nations as early as possible and that such affiliation would provide the centres with the necessary recognition and would strengthen the possibilities of attracting donors and of establishing academic relationships with national and international space-related institutions".

1. Regional centres for space science and technology education

(a) Africa

8. The regional Centre for Space Science and Technology—in French Language was inaugurated on 24 October 1998 in Casablanca, Morocco. At its first meeting, on 24 October 1998, the Governing Board of the Centre appointed its first Director, Abderrahmani Touzani. The first programme of the Centre will be a two- to three-day seminar, to be attended by most senior administrative and scientific representatives of each of the participating countries, in an attempt to mobilize support for the activities of the Centre in each of the countries concerned.

9. The Regional Centre for Space Science and Technology Education—in English Language was inaugurated on 24 November 1998. At its first meeting, on 24 November 1998, the Governing Board appointed E. E. Balogun as Acting Director of the Centre. A document on the proposed activities of the Centre, which had been developed for implementation in March 1999, as well as other matters relating to the Centre, will be reviewed at the resumed session of the Board in 1999. The document contains proposals for: (a) a workshop on the role of space science and technology in national economic development; (b) a nine-month course on remote sensing and geographic information systems (GIS); and (c) the research orientation of the Centre.

(b) Asia and the Pacific

10. Since its inauguration in India on 1 November 1995, the regional Centre for Space Science and Technology Education in Asia and the Pacific has successfully conducted three courses on remote sensing and GIS and a course on each of the following topics: satellite communications; satellite meteorology and global climate; and basic space science. Upon completion of their nine-month course in each activity, the candidates have carried out a one-year applications project in their home countries.

11. The Programme works closely with the governing boards of the centres on each of their activities.

(c) Latin America and the Caribbean

12. The official inauguration of the regional Centre for Space Science and Technology Education in Latin America and the Caribbean is expected to occur by March 1999. In preparation for the opening of the campus of the Centre in Brazil, the Instituto Nacional de Pesquisas Espaciais (INPE) (Brazilian National Institute for Space Research) has carried out a number of activities for the benefit of States in the region, as follows:

Title of seminar/ training course	*Date*	*Place*	*Number of participants*
Seminar on Space Law	Three days in December 1997	São José dos Campos, Brazil	18
Seminar of the Southern Cone Common Market (MERCOSUR) on Technological Advances of Space Activities for Decision Makers	20-22 May 1998	Montevideo, Uruguay	106 (from six countries in the region and two countries in other regions)
Training Course on Meteorological Satellite Applications	21-25 September 1998	São José dos Campos, Brazil	14 (from two countries)
Twelfth Course in Remote Sensing	11 May to 7 December 1999	INPE facilities	Unspecified number from six countries

(d) Western Asia

13. An evaluation mission to Jordan and the Syrian Arab Republic was conducted from 24 June to 1 July 1998. The reports of the mission are currently being finalized in consultation with the Governments of Jordan and the Syrian Arab Republic, with a view to selecting a host country for a regional centre in western Asia.

(e) Network of space science and technology education and research institutions for States of central, eastern and south-eastern Europe

14. A technical study mission to Bulgaria, Greece, Hungary, Poland, Romania, Slovakia and Turkey was conducted from 24 November to 7 December 1998. The objective of the mission was to undertake a technical study and provide an accurate and informative report that could be used in determining, in each country visited, an agreed framework for the operation of a network of space science and technology education and research institutions.

C. Long-term fellowship programmes for in-depth training

15. The Programme received seven long-term fellowship offers for the period 1998-1999: five of these were from the European Space Agency (ESA) and two from the Government of China. The status of the awards for the period is reflected in annex II of the present report. The fellowship awards cover monthly allowances for room and board and other related expenses. The focus of the fellowship activities offered are described below.

16. The five ESA long-term fellowships are each for a period of one year of research and study at ESA institutions in the following disciplines:

(a) One fellowship for Space Antennas and Electromagnetism;

(b) Two fellowships for Remote Sensing Information Systems, tenable at the European Space Research Institute (ESRIN) in Frascati, Italy;

(c) One fellowship for Remote Sensing Instrumentation, tenable at ESTEC in Noordwijk, Netherlands;

(d) One fellowship in Communications Systems, tenable at ESTEC in Noordwijk.

17. The above-mentioned ESA fellowship awards were advertised in December 1997. Selected candidates will begin their studies at the specified ESA institutions in January 1999.

18. The two fellowship awards from China are each for a period of one year of research and study in geodesy,

photogrammetry and remote sensing research at the Wuhan Technical University of Surveying and Mapping in Wuhan, China.

19. The fellowship programme initiated by the Programme in 1985 in Brazil at INPE has fully matured through its financial co-sponsorship by the United Nations University; its operation is now being managed by the two institutions.

D. Technical advisory services and promotion of regional cooperation

20. Various technical advisory services currently being provided under the auspices of the Programme are described below.

1. Cooperative information network linking scientists, educators, professionals and decision makers in Africa

21. Following the endorsement by the Governing Board of the cooperative information network linking scientists, educators, professionals and decision makers in Africa (COPINE), in Helsinki in July 1997, of the three-part COPINE project document, the Governing Board addressed the future of the project at its meeting held in London on 27 April 1998, and arrived at the following conclusions and recommendations; (a) the African countries participating in the project should each develop its respective national implementation plan for the project based on guidelines consisting of 18 points drawn up by the African countries and the Governing Board; (b) the Governing Board would request the Office for Outer Space Affairs of the Secretariat to take responsibility for ensuring that the national implementation plans are developed on schedule, that is, before the end of September 1998; (c) a practical demonstration of the COPINE project would be undertaken, before the end of 1998, among a selected number of African countries; and (d) the Office should work with the United Kingdom of Great Britain and Northern Ireland in planning the demonstration. The Board emphasized that until the implementation plans were developed by the African countries, it would be difficult for donor countries to determine their level of commitment to the project. The Programme has taken the necessary action on those issues, including a request for additional information from the participating African countries. In addition to the efforts of the Governing Board, the Office is also continuing to seek funding support for the COPINE project.

2. Follow-up activities to the United Nations/European Space Agency basic space science workshop series

22. As reflected in the report of the Expert on Space Applications submitted to the Scientific and Technical Subcommittee at its 1998 session (A/AC.105/693 and Corr.1 and Add.1, annex IV), a number of follow-up programmes and projects have resulted from the series of basic space science workshops that were organized, from 1991 to 1997 under the auspices of the Programme with the cooperation of ESA. The support of the Governments of Japan and of the beneficiaries concerned, that is, Colombia, Egypt, Honduras and Sri Lanka, has facilitated the implementation of the follow-up projects. Basic space science establishments in Morocco, Paraguay, the Philippines, Romania and Viet Nam have expressed interest in undertaking similar activities. In continuing this series, a workshop that will address the feasibility of establishing a World Space Observatory is scheduled to take place in Mafraq, Jordan, in March 1999 (activity number 2 in annex IV to the present report).

3. Asia-Pacific Satellite Communications Council

23. The Asia-Pacific Satellite Communications Council (APSCC), established and inaugurated in Seoul in October 1994 with the support of the Programme, continues to make much progress within the region. Its 1996 conference placed special emphasis on the contribution of satellite technology to the global information infrastructure. The growing recognition of APSCC since its establishment has resulted in its broad international membership, which currently stands at 60 full members and 5 associate members. In addition to its participation in the International Telecommunication Union (ITU) World Radiocommunication Conference of 1997, it also contributed, at that Conference, to the deliberations on the modification of the multilateral coordination approach, with emphasis on gaining access to the unplanned C-, Ku- and Ka-bands. In October 1998, APSCC put forward an initiative for an Asia-Pacific Regional Satellite Organization. The latter is perceived as being comparable to the Arab Satellite Communications Organization (ARABSAT) and the European Telecommunications Satellite Organization (EUTELSAT), and has been conceived as a vehicle for the contribution of the region of Asia and the Pacific to the development of satellite communications.

4. Follow-up to the United Nations/Sweden course for educators

24. A workshop to evaluate the impact of the United Nations/Sweden series of courses on remote sensing education for educators, held annually in Sweden since 1990, except in 1991, and to determine the future direction of the course, was held at Gaborone, Botswana, from 18 to 21 October 1998. The following major problems were identified: (a) insufficient access to satellite imagery for teaching and research purposes; (b) insufficient networking, cooperation and collaboration; (c) lack of reliable and efficient access to information on remote sensing development; (d) lack of political support; (e) limited access to information on training opportunities to address problems of insufficient skilled manpower; and (f) insufficient access to information on the development of appropriate curricula for remote sensing and GIS.

25. In view of the many local obstacles noted by educators in remote sensing in Africa and the corresponding loss of opportunity for developing national understanding and the use of a technology that has a significant impact on social and economic development, the Programme has proposed the implementation of a high-level programme of awareness on a country-by-country basis. As currently envisaged, representatives of the Office and the Swedish International Development Cooperation Agency (SIDA) will visit selected countries in Africa and meet with high-ranking government and university officials to discuss ways in which many of the local obstacles could be overcome in order to reap the benefits of the training received during the United Nations/Sweden course series. The proposal will be discussed with SIDA in 1999.

26. Proposals made during each workshop panel discussion were compiled into a single list and workshop participants were required to grade the importance of each proposal and its relevance to alleviating conditions within their particular local settings. That subsequently allowed ready identification of a limited number of priority proposals which, for the majority of participants, would be the most useful in furthering the local development of remote sensing education. The proposals were classified into three categories. Implementation of the proposals within the first category requires coordinated action by graduates of the United Nations/Sweden training course, acting as a group. The second category of proposals includes those requiring action by national and international entities. The third category concerns actions that principally involve the responsibility of individuals, acting more or less independently.

5. Follow-up activities to the United Nations/European Space Agency-sponsored training courses

27. Further to the technical assistance programme reflected in the report of the Expert on Space Applications submitted in 1998 (A/AC.105/693 and Corr.1 and Add.1, paras. 24-26), project proposals endorsed by their respective institutions and agencies were submitted for funding by participants in the four training courses (1993 to 1995 and 1997) held at the facilities of ESRIN. Those proposals were subsequently evaluated by a joint United Nations/ESA review panel in July 1998.

28. On the whole, after a detailed, two-stage review conducted by the joint panel, three proposals were selected for implementation and subsequent funding from the $150,000 available through the United Nations Trust Fund for New and Renewable Sources of Energy. The selected proposals are as follows:

(a) Project proposal submitted by the Asociación Boliviana de Teledetección para el Medio Ambiante (ABTEMA) on the use of C-band synthetic aperture radar (SAR) and optical data to monitor glaciers and snow cover for optimization of water supply predictive models and to study climatic changes and natural hazards. The project is to be carried out by ABTEMA in cooperation with the Universidad Nacional of San Juan (Argentina), the Pontificia Universidad Católica of Chile, the Universidad de Chile and the Ministry for Public Works, Dirección General de Aguas, of Chile;

(b) Project proposal submitted by the Regional Centre for Training and Applications in Agrometeorology and Operational Hydrology (AGRHYMET), to be carried out in cooperation with the Direction de l'Inventaire des Resources Hydrauliques of Burkina Faso, for the development of an information system for determining, monitoring and assessing flood areas and the establishment of an inventory of water resources in the Nakambé river basin of Burkina Faso;

(c) Project proposal submitted by the Remote Sensing Center of Viet Nam for the application of remote sensing technology in coastal management in Viet Nam.

29. The three proposals are being revised to incorporate the recommendations made by the joint review panel, thus making them fully qualified to obtain grants under the technical assistance programme from the Trust Fund.

6. Twelfth plenary meeting of the Committee on Earth Observation Satellites

(a) Partnership through the Integrated Global Observing Strategy

30. In 1996, the Committee on Earth Observation Satellites (CEOS) concluded that an Integrated Global Observing Strategy (IGOS) was needed to ensure coordination and cooperation in Earth Observation programmes. IGOS should integrate joint planning for cost-effective space and *in situ* systems, intercalibration, compatibility of data delivery systems and better links between data users and providers.

31. CEOS members are currently participating in an IGOS mechanism that will provide members with a prioritized set of observational requirements, for both research and operational applications, as inputs to programme planning. The IGOS Strategic Implementation Team continues to stress that IGOS should be incrementally implemented through carefully targeted project activities. Support for current IGOS projects has reflected individual agency interests as projects have variously fulfilled the needs of CEOS members.

32. The Office for Outer Space Affairs participated in the 1996 CEOS meeting, held in Seattle, Washington, United States of America, that led to the development of the IGOS initiative.

33. At the twelfth CEOS plenary meeting held in Bangalore, India, from 10 to 12 December 1998, IGOS was transformed into an independent partnership open to all members of CEOS and others with programmes and projects that are in conformity with IGOS objectives. The Office should participate in the IGOS Partnership through the contribution of its network of space science and technology education centres that are being established, on a regional basis, around the world. Through those centres, the Office will bring to the IGOS partnership a greater participation by developing countries, contributing in particular to the successful implementation of programmes proposed by other IGOS partners. The Office was invited to join a task force, chaired by the Food and Agriculture Organization of the United Nations, that will plan and coordinate the programme of presentations, draft statements and organization of the one day workshop on IGOS during UNISPACE III.

(b) Spectrum allocation

34. At its eleventh plenary meeting, held in 1997 in Toulouse, France, CEOS requested its Ad Hoc Group of Experts on Spectrum Management to contact ITU concerning relevant preparations for the 1999 World Radiocommunication Conference. At its twelfth plenary meeting, CEOS called on all its member agencies and associates to urge their respective administrations to consider making proposals to the 1999 Conference and future world radiocommunication conferences in respect of frequency allocations that are critical for Earth Observation. The relevant spectra include the following: 420-480 megahertz (MHz), useful to observe tropical storms; 4.20-4.40 gigahertz (GHz), useful for observing sea surface temperature through clouds; 5,150-5,260 MHz and 5,460-5,580 MHz, useful for spaceborne radiometry and SAR observation; 18.6-18.8 GHz, very useful in obtaining worldwide critical environmental measurements; and beyond 71 GHz, covering a series of spectral bands that are very useful for the acquisition of data essential to studies of climate and changes in the Earth environment.

(c) Committee on Earth Observation Satellites and the private sector

35. CEOS has for some time recognized the evolution of the commercial aspect of Earth Observation, and concluded in 1997 that a way should be found to engage the private sector in CEOS activities. At its twelfth plenary meeting, CEOS agreed that a mechanism must be established, under the control of the CEOS secretariat, to provide a more effective interface with the private sector. In that connection, CEOS agreed to organize the following: meetings for an exchange of views and information on specific topics between a CEOS subgroup and commercial companies interested in a particular topic; and dedicated workshops that would bring together CEOS members and companies in the private sector. The International Society for Photogrammetry and Remote Sensing (ISPRS), an associate of CEOS, was mandated by CEOS to assume that responsibility. The Office will collaborate with ISPRS in that endeavour.

E. Training courses, workshops, conferences and symposia organized by the United Nations

1. Activities carried out in 1998

36. In 1998, in addition to the mandated regional preparatory conferences for UNISPACE III (see paras. 4 and 5 above and annex I), four workshops, one training course, one conference and one symposium were conducted under the auspices of the Programme. A summary

of each of those activities is given in annex III to the present report.

2. Activities scheduled for implementation in 1999

37. The training courses, workshops, conferences and symposia scheduled for 1999 are shown in annex IV.

3. Activities proposed for implementation in 2000

38. The activities to be organized, under the auspices of the Programme, in the year 2000, will be predicated on UNISPACE III recommendations.

F. Space information

39. The ninth in the series of selected papers from the activities of the Programme, entitled *Seminars of the United Nations Programme on Space Applications* (A/AC.105/711), has been issued. The third edition of the directory entitled *Education, Training, Research and Fellowship Opportunities in Space Science and Technology and its Applications* (A/AC.105/671) has also been issued. Information contained in the directory is also available through the home page of the Programme on the Internet.

40. Information for Member States and the general public on the latest developments in the activities carried out by the Programme can be found on the home page of the Programme established on the Internet as part of the home page of the Office for Outer Space Affairs. This home page is accessible through the World Wide Web using the address http://www.un.or.at/OOSA/sapiax.html, and it contains information on activities that have been implemented as well as reports and press releases issued within the framework of the Programme. The schedules, objectives and programmes of planned activities and projects are also included in the home page.

III. Voluntary contributions

41. The successful implementation of the activities of the Programme in 1998 benefited from the support and voluntary contributions of Member States of the United Nations and their institutions, as well as from the assistance and cooperation of regional and other international governmental and non-governmental organizations. In 1998, the Programme received voluntary contributions, both in money and in kind, including the sponsorship of technical and scientific presentations by several experts, as described below.

42. A number of Member States (Australia, Austria, Botswana, Chile, India, Malaysia, Morocco, Nigeria, Spain and Sweden), governmental and non-governmental organizations (World Meteorological Organization, Austrian Space Agency, Centre National d'Études Spatiales (CNES) (French National Centre for Space Studies), ESA, European Commission, European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), Instituto Nacional de Técnica Aeroespacial (Spanish Mission Control Centre), Federal Laboratory Consortium (United States of America), International Astronautical Federation, ISPRS, National Aeronautics and Space Administration of the United States, SIDA and the Swedish Space Corporation (SSC Satellitbild)) and other corporations and institutions (Lockheed Martin Corporation (United States), Spectrum Astro, Inc. (United States) and Stockholm University) provided support for the activities of the Programme in 1998 in various ways, including the following:

(a) Defraying the local expenses of candidates from developing countries in the long-term fellowship programmes (see annex II);

(b) Voluntary cash contributions of $25,000 received from the Government of Austria as well as from Spectrum Astro, Inc., $5,000 from Lockheed Martin Corporation, $3,200 from EUMETSAT and $2,500 from the Federal Laboratory Consortium, in support of the activities of the Programme;

(c) A financial contribution of $125,000 received from ESA in support of specific 1998 activities of the Programme as reflected in annex III;

(d) Co-sponsorship of the activities of the Programme and, in particular, defrayal of the costs of international air travel of participants, local organization and facilities, room and board, and local transportation (see annex III);

(e) Sponsorship (travel and daily subsistence allowance) of experts from Member States to make technical presentations and take part in deliberations on the activities of the Programme (see annex III).

IV. Financial provisions and administration of activities during the biennium 1998-1999

43. The activities of the Programme in 1999 covered in the present report will be implemented as follows:

(a) *Financial provisions.* Under the United Nations regular budget, a sum of $434,100 was approved in the programme budget by the General Assembly, at its fifty-second session, for implementing the activities of the Programme during the biennium 1998-1999. A balance of $217,000 from this budget will be used to implement the 1999 activities of the Programme. In order to effectively carry out its mandated and expanded activities, it has become necessary for the Programme to solicit additional funds, in the form of voluntary contributions, in support of its activities. Those contributions will be used to supplement the regular budget of the Programme;

(b) *Administration by and contributions and participation of staff.* The Office for Outer Space Affairs, and in particular the Expert on Space Applications and his staff, will carry out the activities described in the present report. In that connection, travel will be undertaken as appropriate by the Expert and his staff under the provisions of the travel budget of the Office for the biennium and as may be necessary from voluntary contributions.

Notes

[1] *Official Records of the General Assembly, Fifty-second Session, Supplement No. 20* (A/52/20, para. 153).

Annex I

Summary of the regional preparatory conferences for UNISPACE III held in 1998

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
Regional Preparatory Conference for UNISPACE III for Asia and the Pacific Kuala Lumpur, 18-22 May 1998	Government of Malaysia, United Nations and ESA (Space Science and Studies Division, Ministry of Science, Technology and the Environment)	(a) Air travel and subsistence for 16 participants (United Nations and ESA); room and board for 7 participants and conference facilities (Government of Malaysia) (b) 28 countries and organizations (c) 64 participants	The conference, by consensus, arrived at a number of recommendations, including the following, which recognized the need for States in Asia and the Pacific: (a) to network the educational facilities in the region in order to impact education and training in the various disciplines of space technology at post-graduate level; (b) to increase the awareness of policy and decision makers of the potential of space remote sensing and related technologies, particularly in prediction, warning and mitigation of natural disasters such as earthquakes, floods, droughts and tropical cyclones; (c) to take advantage of the opportunities for regional collaboration provided through the implementation of joint projects such as satellite-based disaster monitoring, management and mitigation, particularly for the benefit of the States of the region, including the Pacific island States; (d) to share space as well as ground-segment capabilities to the extent possible with their counterparts; (e) to coordinate and harmonize the many ground-receiving-station operators of the Earth Observation satellite in the region of Asia and the Pacific, particularly in relation to the advent of hyperband observing systems, in order to develop a unified approach in the acquisition, processing and handling of remote sensing data using a standard format; and (f) to implement a regional collaborative project involving small satellites, based on a common payload, thus enabling a number of participating countries in the region to develop their human resources in the discipline and enabling the project to serve also as a technology demonstrator and a catalyst. (Detailed report contained in document A/CONF.184/PC/2.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support (b) Number of participating countries and organizations (c) Total number of participants*	*Outcome of activity*
Regional preparatory conference for UNISPACE III for Latin America and the Caribbean Concepción, Chile, 12-16 October 1998	Government of Chile , United Nations and ESA (Ministry of Foreign Affairs, University of Concepcion, Intendencia de la Región del Biobio)	(a) Air travel and subsistence for 18 participants (United Nations and ESA); air travel and subsistence for 10 participants and hosting facilities (Chile) (b) 33 countries and organizations (c) 170 participants	A selected number of recommendations addressed to States in the region and prepared by the two working groups established at the conference are presented below. The conference agreed to forward the entire set of recommendations to the Group of Latin America and Caribbean States at Vienna for their further consideration and refinement, with a view to concluding them in time for the next session of the Advisory Committee in February 1999. The aims of the selected recommendations include the following: (a) to promote the establishment of national focal points, such as national space agencies or commissions, through which all sectors of civil society concerned with such matters might participate; (b) to foster an active process of regional cooperation through, for example, the establishment of a permanent mechanism for coordination among agencies and other space institutions in the region, as well as harmonization of legislative matters related to cooperation in space affairs; (c) to expand the capacities of the countries of the region through education in space sciences as applied to environmental management, starting from the primary school level, while promoting opportunities for training and research and development for professionals in remote areas; (d) to promote the interlinking and effective cooperation of advisory (research) technical agencies with the operational agencies responsible for dealing with emergencies, through the use of telecommunications; (e) to encourage the use of remote sensing to protect the environment and ecosystems such as nature reserves, forests and coastal areas with a view to reducing the incidence of natural, chemical and socio-organizational disasters; and (f) to promote the declaration of an international decade aimed at the formulation of an integrated strategy for the use of space technology (2000-2010) for risk evaluation and disaster prevention, mitigation and relief. (Detailed report contained in document A/CONF.184/PC/3.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support (b) Number of participating countries and organizations (c) Total number of participants*	*Outcome of activity*
Regional preparatory conference for UNISPACE III for Africa and the Middle East Rabat, 26-30 October 1998	Government of Morocco, United Nations, ESA (Centre Royal de Télédétection Spatiale)	(a) Air travel (United Nations); room and board for 16 participants (Morocco) (b) 28 countries (c) 221 participants	The recommendations agreed to, by consensus, at the conference, include the following: (a) States in the two regions are encouraged to fully support and actively participate in the African regional centres for space science and technology education that have been established, under the auspices of the United Nations, in Morocco and Nigeria, and to be established in western Asia, with a view to building indigenous capabilities in space science and technology in each country and within the regions as a whole; (b) African States, the United Nations and the international community should fully support the development of an inter-African connection for telephony, data, tele-education, telemedicine, and the Internet, particularly through the realization of the COPINE project, an initiative of the Office for Outer Space Affairs. COPINE aims at solving the problems caused by the insufficient exchange of information in rural development, health care and education, management of natural resources and the environment, agricultural research and development and science and technology; (c) The States concerned should invest, through regional collaboration, in the development of necessary knowledge and skills of their citizens in different aspects of space science and technology, particularly through their participation in the development, design and fabrication of small satellites, with a view to gaining an understanding of the technology and the subsequent use of such small satellites for various socio-economic applications; (d) in order to maximize the beneficial impact of the numerous projects that are funded by donors and international organizations, including United Nations agencies, it is critical that the concerned donors and organizations and the countries that benefit from such projects coordinate and harmonize them; (e) The United Nations should establish, as a matter of urgency, a special fund of the Office to assist in the implementation of the recommendations of UNISPACE III; and (f) An African leadership conference at the level of either head of State or minister should be organized by the Office, with a view to increasing the level of awareness of space technology development and its impact on social and economic development. (Detailed report contained in document A/CONF.184/PC/4.)

Annex II

Long-range fellowships offered by the European Space Agency within the framework of the United Nations Programme on space applications, 1998-1999

Period	*Country or organization*	*Subject*	*Financial support by host country or organization*	*Fellowships offered*	*Candidates selected*	*Applications submitted*	*User countries (one or more candidates)*
1998/1999	ESA	Space antennas and electromagnetism	Subsistence allowance	1	1	13	Azerbaijan
1998/1999	ESA	Remote sensing information systems	Subsistence allowance	2	2	40	Azerbaijan, Viet Nam
1998/1999	ESA	Remote sensing instrumentation	Subsistence allowance	1	1	10	Republic of Korea
1998/1999	ESA	Communications systems	Subsistence allowance	1	1	37	Mongolia
1998/1999	China	Geodesy, photogrammetry and remote sensing	Subsistence allowance	2	1	1	Viet Nam

Annex III

Summary of United Nations training courses, workshops, conferences and symposia held in 1998

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support (b) Number of participating countries and organizations (c) Total number of participants*	*Outcome of activity*
Workshop on Emerging Trends in Satellite Meteorology Ahmedabad, India 9-12 March 1998	Government of India, United Nations and ESA (Regional Centre for Space Science and Technology Education in Asia and the Pacific, Indian Space Research Organisation (ISRO))	(a) United Nations provided $8,800 for the travel of some participants (b) 12 countries (c) 75 participants	The workshop was held in memory of Verner Suomi, to commemorate his great achievements in modern science, including his invention of many simple, elegant and widely used meteorological devices. The lecturers at the workshop were key professionals and experts in the field of satellite meteorology from different parts of the world. The focus of the workshop was the emerging trends in satellite meteorology, with special emphasis on technology and applications. The presentations on the whole were grouped under the following categories: satellites for short-, medium- and long-term timescales; applications and retrieval; Earth Observation-emerging scenario; media and education; satellite measurements of rainfall; and meteorological observations and climate change.
Second United Nations International Conference on Spin-off Benefits of Space Technology Tampa, Florida, United States 30 March-3 April 1998	United Nations, Spectrum Astro, Inc., ISPRS, Lockheed Martin Corporation, Federal Laboratory Consortium (United States)	(a) Air travel for 10 participants (United Nations); room and board for 10 participants (Spectrum Astro, Lockheed Martin, Federal Laboratory Consortium) (b) 17 countries and international organizations (c) 55 participants	Aspects of spin-off benefits explored included: technology transfer; communication and information technologies; commercial remote sensing; legal, financial and cooperative aspects of commercial partnership; challenges for developing countries, particularly in the areas of emerging markets. Other spin-off opportunities addressed were in health, education and energy development, disaster prevention and mitigation and the use of satellite data in support of fisheries operations. Participants also discussed concerns about the marketing of technologies in developing countries and how such technologies could be made available and effectively utilized in those countries. (Detailed report contained in document A/AC.105/706.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support (b) Number of participating countries and organizations (c) Total number of participants*	*Outcome of activity*
Eighth United Nations/Sweden International Training Course on Remote Sensing Education for Educators Stockholm and Kiruna, Sweden 4 May-12 June 1998	Government of Sweden and United Nations (Stockholm University, SSC Satellitbild)	(a) Air travel and expenses en route (United Nations); all other expenses including room and board and local travel (b) 18 countries (c) 24 participants	The following recommendations made by the participants were aimed at improving the Course to make it more responsive to evolving needs in their countries and academic institutions: (a) the parts of the Course dealing with visual image interpretation and remote sensing curricula should be shortened; (b) the parts of the Course dealing with digital image processing, GIS, radar and cost-benefit analysis should be expanded; (c) the availability of satellite images of their home countries requested by participants for use during the Training Course should be improved; and (d) the amount of free time allowed to participants to review the copious volume of technical material presented during lectures should be increased. The Office for Outer Space Affairs, Stockholm University and SIDA are currently reviewing the above recommendations, including the feasibility of holding a more advanced course for educators in remote sensing. (Detailed report contained in document A/AC.105/704.)
United Nations/European Space Agency Symposium on Economic Benefits of Using Space Technology Applications in Developing Countries Graz, Austria 7-10 September 1998	Government of Austria, United Nations, ESA, European Commission (State of Styria, City of Graz)	(a) Air travel and subsistence allowance for 30 participants and other expenses (b) 42 countries (c) 100 participants	The United Nations/ESA Symposium is now fairly well established as an annual event for discussing the use of space technology applications in developing countries. The discussions and the exchange of first-hand experiences and opinions resulted in a set of guidelines on how to most efficiently introduce the broad range of space benefits to developing countries. Furthermore, the Symposium will be used as a starting point for a number of projects initiated by participants in the meeting (for example, a remote sensing workshop in Bolivia based on the outcome of the Graz meeting). (Detailed report contained in document A/AC.105/712.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support (b) Number of participating countries and organizations (c) Total number of participants*	*Outcome of activity*
First United Nations Workshop on the International Search and Rescue Satellite System (COSPAS-SARSAT) for African search and rescue points of contact (SPOCS) and the Spanish Mission Control Centre Maspalomas, Canary Islands, Spain 24-25 September 1998	Government of Spain, United Nations, ESA Instituto Nacional de Técnica Aeroespacial (INTA) Centro Nacional Espacial de Canarias, Maspalomas)	(a) Air travel for 11 persons (United Nations); room and board (INTA) (b) 9 countries (c) 20 participants	The Workshop was organized to provide those countries that are within the range of the COSPAS-SARSAT station in Maspalomas to gain the necessary knowledge to enable them to participate in the COSPAS-SARSAT programme. To accomplish that objective, the programme of the Workshop focused on the following: (a) the use of maritime, aeronautical and personal locator beacons (PLBs); (b) the use of PLBs in areas and places isolated from populated settlements; (c) the importance of creating a national register for radio beacons; (d) the regulations needed to use the COSPAS-SARSAT system; (e) the establishment and identification of a national point of contact—SPOC; (f) the interpretation of alert messages; and (g) the elimination of possible interference in the frequencies reserved for the COSPAS-SARSAT system. (Detailed report contained in document A/AC.105/713.)
United Nations/ International Astronautical Federation (IAF) Workshop on Expanding the User Community of Space Technology in Developing Countries Melbourne, Australia 24-27 September 1998	Government of Australia, United Nations, CNES, IAF (Cooperative Research Centre for Satellite Systems)	(a) Air travel, subsistence allowance and facilities, equipment (b) 29 countries and organizations (c) 100 participants	The United Nations and IAF conceived this Workshop series as a unique discussion forum for space experts, policy and decision makers and representatives from private industry. The Workshop is now fairly well established as an essential component of the IAF Congress. The current format, which encourages the participation of representatives from private industry, will be maintained. As has been the case in the past, contacts established between participants resulted in a number of initiatives and activities (for example, memoranda of understanding signed or planned to be signed between space agencies/government organizations in emerging spacefaring States and a well-known manufacturer of small satellites and microsatellites) that strengthened the role of space-technology applications in improving the quality of life in developing countries. (Detailed report contained in document A/AC.105/714.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
Workshop on the Evaluation of the United Nations/ Swedish International Development Cooperation Agency International Training Course Series on Remote Sensing Education for Educators Gaborone, Botswana 18-21 October 1998	Government of Sweden, United Nations (SIDA, Stockholm University, Department of Physical Geography)	(a Air travel and daily subsistence allowance for: 5 participants (United Nations) 27 participants (Sweden) (b) 16 countries (c) 32 participants	The Course organizers, that is, Sweden and the United Nations, agreed to work with the participants, upon request, to assist them in securing recognition for, and the marketing of, their skills in their respective countries. Such an effort would require a partnership between the local government authorities, the institutions of the participants, the local office of the United Nations Development Programme, the participants and the Permanent Missions to the United Nations of the countries concerned. The Office for Outer Space Affairs will serve as the focal point for this effort. (Detailed report contained in A/AC.105/709.)

Annex IV

United Nations Programme on Space Applications: schedule of training courses, workshops, conferences and symposia in 1999

Activity number	*Activity*	*Date and place*	*Objective*
1	Regional preparatory conference for UNISPACE III for eastern Europe	25-29 January 1999 Bucharest, Romania	Regional preparatory meetings for UNISPACE III are being organized in consultation with Member States in each region. The programme of this preparatory meeting reflects the elements of the annotated agenda of UNISPACE III. The outcome of the meeting will serve as input into the UNISPACE III draft report.
2	United Nations/European Space Agency Workshop on Basic Space Science	13-17 March 1999 Mafraq, Jordan	This workshop will address the feasibility of establishing a World Space Observatory and a worldwide network of small astronomical telescopes.
3	American Institute of Aeronautics and Astronautics Workshop on International Space Cooperation: Solving Global Problems	11-15 April 1999 Bermuda	To focus on specific problems of global significance, including topics of special interest to developing countries. The results of this workshop will be presented at UNISPACE III in July 1999
4	Regional workshop (in French language) on the role of the regional Centre for Space Science and Technology—in French Language in national and regional development	Second or third quarter of 1999 Rabat, Morocco	To educate policy makers, planners, research and development agencies and appropriate entities within the private sector on the role of space science and technology in social and economic development and the contributions of the Centre to the achievement of such a goal.
5	Regional Workshop (in English language) on the role of the Regional Centre for Space Science and Technology Education—in English Language in National and Regional Development	Second or third quarter of 1999 Ile-Ife, Nigeria	To educate policy makers, planners, research and development agencies and appropriate entities within the private sector on the role of space science and technology in social and economic development and the contributions of the Centre to the achievement of such a goal.
6	Ninth United Nations/Sweden International Training Course on Remote Sensing Education for Educators	3 May-11 June 1999 Stockholm and Kiruna, Sweden	To develop the knowledge and skills of university educators in remote sensing technology and to equip the participants with the capability to introduce elements of the technology, as appropriate, in the academic curricula of their own universities and institutes.

Activity number	*Activity*	*Date and place*	*Objective*
7	United Nations/European Space Agency Seminar on Space Applications in Promoting Sustainable Agriculture	September 1999 Beijing, China	To educate the participants on new and emerging trends in remote sensing technology, with emphasis on the new generation of high-resolution sensor systems. The workshop will also address: (a) the evaluation of data observed by such systems, particularly for use in precision agriculture; and (b) the development of the necessary software for assessing and analysing related data.
8	Second United Nations Workshop on the International Search and Rescue Satellite System for African search and rescue points of contact and the Spanish Mission Control Centre	September 1999, Maspalomas, Canary Islands, Spain	To train the participants in the organization and establishment of the COSPAS-SARSAT network in each country and to assist them in the planning and design of the required local infrastructure for COSPAS-SARSAT programmes, including the development of curricula for the training of local manpower.
9	Post-UNISPACE III briefing at the Second Asia-Pacific Ministerial Conference on Space Applications for Sustainable Development[a]	2-8 December 1999 New Delhi, India	To brief States in the region of Asia and the Pacific on the outcome of UNISPACE III and to bring to their attention those elements (for example, recommendations) of the Conference that are specific to the region of Asia and the Pacific and to work with those States on the translation of such recommendations into action-oriented programmes.

[a]Similar briefings will be undertaken at appropriate ministerial conferences and meetings in the other regions (covered by the Economic Commission for Latin America and the Caribbean, the Economic Commission for Africa and the Economic and Social Commission for Western Asia).